

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims (deleted text being struck through (or triple bracketed) and added text being underlined):

1 1. (Previously presented) A method of applying
2 polyacrylamide (PAM) for stabilizing soil particles of a land area
3 from erosive movement about the land area, the method comprising:
4 establishing a uniform mixture ratio for a mixture of PAM and water
5 to be applied to a land area;
6 calculating a total application rate for applying the mixture to the
7 land area;
8 mixing PAM with water according to the uniform mixture ratio to
9 form a mixture for application to the land area;
10 applying the mixture to a top surface of soil of the land area; and
11 terminating the application of the mixture when PAM reaches
12 sufficient depth penetration below a top surface of the soil.

1 2. (Original) The method of claim 1 wherein the establishing
2 step includes mixing PAM and water in a ratio of about 1 part PAM
3 to between about 500 and about 5000 parts water by volume.

1 3. (Original) The method of claim 1 wherein the establishing
2 step includes mixing PAM and water in a ratio of 1 part PAM to
3 about 1000 parts water by volume.

1 4. (Original) The method of claim 1 additionally comprising
2 the step of determining a number of times that the mixture of the
3 uniform mixture ratio needs to be applied to the land area to achieve
4 the calculated total application rate of the PAM.

1 5. (Original) The method of claim 1 wherein the applying
2 step comprises making a series of applications of the mixture to the
3 surface for a number of times until the application rate for the soil
4 of the land area is achieved.

1 6. (Original) The method of claim 1 wherein the applying
2 step includes misting a portion of the total application rate of the
3 mixture onto the surface of the land area to produce a tack coat for
4 initially stabilizing topmost soil particles on the top surface of the
5 land area against soil particle movement caused by subsequent
6 mixture applications.

1 7. (Original) The method of claim 1 wherein the applying
2 step includes continuing to apply the mixture to the surface of the
3 soil until the soil of the land area becomes saturated and stopping
4 the application of the mixture top surface becomes saturated.

1 8. (Previously Presented) The method of claim 7 additionally
2 comprising detecting saturation of the soil when the mixture
3 accumulates on the surface rather than being absorbed into the
4 ground and the mixture on the top surface reflects ambient light.

1 9. (Original) The method of claim 8 wherein the applying
2 step includes waiting for a time period after detection of saturation
3 such that the mixture is able to penetrate the ground below the
4 surface, wherein the time period comprises the time required for any
5 puddles of the mixture on the top surface of the soil to be absorbed
6 into the soil below the top surface.

1 10. (Original) The method of claim 9 wherein the waiting
2 step is conducted for a time period that is less than the time
3 required for the top surface of the soil to dry.

1 11. (Original) The method of claim 1 wherein the applying
2 step includes the step of directing a spray of the mixture onto the
3 top surface of the soil of the land area from at least four directions,
4 each of the directions being oriented at about 90 degrees to at least
5 two of the other directions.

1 12. (Original) The method of claim 11 wherein the applying
2 step includes the step of directing a spray of the mixture at a
3 substantially perpendicular angle downward onto the top surface of
4 the soil of the land area, wherein the direction of the substantially
5 perpendicular spray varies less than about 15 degrees measured from
6 an axis perpendicular to the surface of the soil.

1 13. (Original) The method of claim 1 additionally comprising
2 testing the extent of penetration of the PAM below the top surface
3 of the soil of the land area.

1 14. (Previously Presented) The method of claim 1 wherein
2 the testing step includes removing a core sample of the soil from the
3 land area.

1 15. (Original) The method of claim 1 additionally comprising
2 the step of comparing the depth penetration of the PAM below the
3 top surface of the soil of the land area to a set of minimum depth
4 penetration values based upon the general slope of the land area to
5 determine the minimum depth penetration needed for the land area
6 being treated before terminating application of the mixture to the
7 land area;

8 wherein if the general slope of the land area is between
9 substantially level and a general slope of 4 to 1, inclusive, the
10 sufficient depth penetration is a minimum of about 1.3 inches;

11 wherein if the general slope of the land area is about 3 to 1,
12 the sufficient depth penetration is a minimum of about 1.5 inches;

13 wherein if the general slope of the land area is about 2 to 1,
14 the sufficient depth penetration is a minimum of about 2 inches;

15 wherein if the general slope of the land area is about 1.5 to 1,
16 the sufficient depth penetration is a minimum of about 2.5 inches;

17 and

18 wherein if the general slope of the land area is about 1 to 1 or
19 steeper, the sufficient depth penetration is a minimum of about 3
20 inches.

1 16. (Original) The method of claim 15 additionally
2 comprising exceeding the total application rate calculated if the
3 sufficient minimum depth penetration is not achieved through
4 application of mixture to the soil at the total application rate.

1 17. (Previously Presented) A method of applying
2 polyacrylamide (PAM) for stabilizing soil particles of a land area
3 from erosive movement about the land area, the method comprising;
4 establishing a uniform mixture ratio for a mixture of PAM and water
5 to be applied to a land area;
6 calculating a total application rate for applying the mixture to the
7 land area;
8 mixing PAM with water according to the uniform mixture ratio to
9 form a mixture for application to the land area; and
10 applying the mixture to a top surface of soil of the land area by
11 misting a top surface of the land area with the mixture for
12 producing a tack coat of the PAM for initially stabilizing
13 topmost soil particles on the top surface of the land area

14 against soil particle movement caused by any subsequent
15 mixture applications.

1 18. (Original) The method of claim 17 additionally
2 comprising the step of determining a number of times that the
3 mixture of the uniform mixture ratio needs to be applied to the land
4 area to achieve the calculated total application rate of the PAM.

1 19. (Previously Presented) The method of claim 18 wherein
2 the applying step comprises making a series of applications of the
3 mixture to the soil according to the number of times determined to
4 achieve the total application rate for the soil of the land area.

1 20. (Original) The method of claim 17 wherein the applying
2 step includes continuing to apply the mixture to the surface of the
3 soil until the soil of the land area becomes saturated and stopping
4 the application of the mixture top surface becomes saturated.

1 21. (Previously Presented) The method of claim 20
2 additionally comprising detecting saturation of the soil when the
3 mixture accumulates on the surface rather than being absorbed into
4 the ground and the mixture on the top surface reflects ambient light.

1 22. (Original) The method of claim 21 wherein the applying
2 step includes waiting for a time period after detection of saturation
3 such that the mixture is able to penetrate the ground below the
4 surface, wherein the time period comprises the time required for any
5 puddles of the mixture on the top surface of the soil to be absorbed
6 into the soil below the top surface.

1 23. (Original) The method of claim 22 wherein the waiting
2 step is conducted for a time period that is less than the time
3 required for the top surface of the soil to dry.

1 24. (Original) The method of claim 17 wherein the applying
2 step includes the step of directing a spray of the mixture onto the
3 top surface of the soil of the land area from at least four directions,
4 each of the directions being oriented at about 90 degrees to at least
5 two of the other directions.

1 25. (Original) The method of claim 17 wherein the applying
2 step includes the step of directing a spray of the mixture at a
3 substantially perpendicular angle downward onto the top surface of
4 the soil of the land area, wherein the direction of the substantially
5 perpendicular spray varies less than about 15 degrees measured from
6 an axis perpendicular to the surface of the soil.

1 26. (Original) The method of claim 17 additionally
2 comprising testing the extent of penetration of the PAM below the
3 top surface of the soil of the land area.

1 27. (Previously Presented) The method of claim 17 wherein
2 the testing step includes removing a core sample of the soil from the
3 land area.

1 28. (Previously Presented) The method of claim 17
2 additionally comprising the step of terminating the application of
3 the mixture when PAM penetrates below a top surface of the soil.

1 29. (Original) The method of claim 28 additionally
2 comprising comparing the depth penetration of the PAM below the
3 top surface of the soil of the land area to a set of minimum depth
4 penetration values based upon the general slope of the land area to
5 determine the minimum depth penetration needed for the land area
6 being treated before terminating application of the mixture to the
7 land area;

8 wherein if the general slope of the land area is between
9 substantially level and a general slope of 4 to 1, inclusive, the
10 sufficient depth penetration is a minimum of about 1.3 inches;

11 wherein if the general slope of the land area is about 3 to 1,
12 the sufficient depth penetration is a minimum of about 1.5 inches;

13 wherein if the general slope of the land area is about 2 to 1,
14 the sufficient depth penetration is a minimum of about 2 inches;

15 wherein if the general slope of the land area is about 1.5 to 1,
16 the sufficient depth penetration is a minimum of about 2.5 inches;

17 and

18 wherein if the general slope of the land area is about 1 to 1 or
19 steeper, the sufficient depth penetration is a minimum of about 3
20 inches.

1 30. (Original) The method of claim 17 wherein the
2 establishing step includes mixing PAM and water in a ratio of about
3 1 part PAM to between about 500 and about 5000 parts water by
4 volume.

1 31. (Original) The method of claim 17 additionally
2 comprising the step of considering the relative compaction of the
3 soil of the land area, and increasing a number of times of
4 applications of the mixture if the top surface of the soil of the land
5 area has a compacted crust for loosening the compaction of the soil
6 to enhance the penetration of subsequent applications of the mixture
7 into the soil.

32. through 38. (Cancelled)

1 39. (Previously presented) A method of applying
2 polyacrylamide (PAM) for stabilizing soil particles of a land area
3 from erosive movement about the land area, the method comprising;

4 mixing PAM with water to form a mixture for application to the land
5 area;
6 applying the mixture to a top surface of soil of the land area until
7 the soil of the land area becomes saturated, and stopping the
8 application of the mixture when the top surface becomes
9 saturated and the mixture accumulates on the surface rather
10 than being absorbed into the ground and the mixture on the top
11 surface reflects ambient light; and
12 terminating the application of the mixture when PAM penetrates
13 below a top surface of the soil.

1 40. (Previously Presented) The method of claim 39
2 additionally comprising the step of establishing a uniform mixture
3 ratio for a mixture of PAM and water to be applied to a land area,
4 and wherein the mixture formed by the mixing step has a ratio of
5 PAM and water corresponding to the uniform mixture ratio.

1 41. (Previously Presented) The method of claim 40
2 additionally comprising the step of calculating a total application
3 rate for applying the mixture to the land area, and additionally
4 comprising the step of determining a number of times that the
5 mixture of the uniform mixture ratio needs to be applied to the land
6 area to achieve the calculated total application rate of the PAM.

1 42. (Previously Presented) The method of claim 39
2 additionally comprising the step of calculating a total application
3 rate for applying the mixture to the land area, and wherein the
4 applying step comprises making a series of applications of the
5 mixture to the surface for a number of times until the application
6 rate for the soil of the land area is achieved.

43. (Cancelled)

1 44. (Previously Presented) The method of claim 1 wherein
2 the establishing step includes mixing PAM and water in a ratio of
3 about 1 part PAM to between about 500 and about 5000 parts water
4 by volume;

5 additionally comprising the step of determining a number of
6 times that the mixture of the uniform mixture ratio needs to be
7 applied to the land area to achieve the calculated total application
8 rate of the PAM;

9 wherein the applying step comprises making a series of
10 applications of the mixture to the surface for a number of times
11 until the application rate for the soil of the land area is achieved;

12 wherein the applying step includes misting a portion of the
13 total application rate of the mixture onto the surface of the land
14 area to produce a tack coat for initially stabilizing topmost soil
15 particles on the top surface of the land area against soil particle
16 movement caused by subsequent mixture applications;

17 wherein the applying step includes continuing to apply the
18 mixture to the surface of the soil until the soil of the land area
19 becomes saturated and stopping the application of the mixture top
20 surface becomes saturated;

21 additionally comprising detecting saturation of the soil when
22 the mixture accumulates on the surface rather than being absorbed
23 into the ground and the mixture on the top surface reflects ambient
24 light;

25 wherein the applying step includes waiting for a time period
26 after detection of saturation such that the mixture is able to
27 penetrate the ground below the surface, wherein the time period
28 comprises the time required for any puddles of the mixture on the
29 top surface of the soil to be absorbed into the soil below the top
30 surface;

31 wherein the waiting step is conducted for a time period that is
32 less than the time required for the top surface of the soil to dry;

33 wherein the applying step includes the step of directing a
34 spray of the mixture onto the top surface of the soil of the land area
35 from at least four directions, each of the directions being oriented
36 at about 90 degrees to at least two of the other directions;

37 wherein the applying step includes the step of directing a
38 spray of the mixture at a substantially perpendicular angle
39 downward onto the top surface of the soil of the land area;

40 additionally comprising testing the extent of penetration of the
41 PAM below the top surface of the soil of the land area; and

42 wherein the testing step includes removing a core sample of
43 the soil from the land area.

1 45. (Previously Presented) The method of claim 44
2 additionally comprising the step of comparing the depth penetration
3 of the PAM below the top surface of the soil of the land area to a
4 set of minimum depth penetration values based upon the general
5 slope of the land area to determine the minimum depth penetration
6 needed for the land area being treated before terminating
7 application of the mixture to the land area;

8 wherein if the general slope of the land area is between
9 substantially level and a general slope of 4 to 1, inclusive, the
10 sufficient depth penetration is a minimum of about 1.3 inches;

11 wherein if the general slope of the land area is about 3 to 1,
12 the sufficient depth penetration is a minimum of about 1.5 inches;

13 wherein if the general slope of the land area is about 2 to 1,
14 the sufficient depth penetration is a minimum of about 2 inches;

15 wherein if the general slope of the land area is about 1.5 to 1,
16 the sufficient depth penetration is a minimum of about 2.5 inches;

17 wherein if the general slope of the land area is about 1 to 1 or
18 steeper, the sufficient depth penetration is a minimum of about 3
19 inches; and

20 additionally comprising exceeding the total application rate
21 calculated if the sufficient minimum depth penetration is not
22 achieved through application of mixture to the soil at the total
23 application rate.

1 46. (Previously Presented) The method of claim 17
2 additionally comprising the step of determining a number of times
3 that the mixture of the uniform mixture ratio needs to be applied to
4 the land area to achieve the calculated total application rate of the
5 PAM;

6 wherein the applying step comprises making a series of
7 applications of the mixture to the soil according to the number of

8 times determined to achieve the total application rate for the soil of
9 the land area;

10 wherein the applying step includes continuing to apply the
11 mixture to the surface of the soil until the soil of the land area
12 becomes saturated and stopping the application of the mixture top
13 surface becomes saturated;

14 additionally comprising detecting saturation of the soil when
15 the mixture accumulates on the surface rather than being absorbed
16 into the ground and the mixture on the top surface reflects ambient
17 light;

18 wherein the applying step includes the step of directing a
19 spray of the mixture onto the top surface of the soil of the land area
20 from at least four directions;

21 wherein the applying step includes waiting for a time period
22 after detection of saturation such that the mixture is able to
23 penetrate the ground below the surface, wherein the time period
24 comprises the time required for any puddles of the mixture on the
25 top surface of the soil to be absorbed into the soil below the top
26 surface;

27 wherein the waiting step is conducted for a time period that is
28 less than the time required for the top surface of the soil to dry;

29 additionally comprising testing the extent of penetration of the
30 PAM below the top surface of the soil of the land area;

31 wherein the testing step includes removing a core sample of
32 the soil from the land area;

33 additionally comprising the step of terminating the application
34 of the mixture when PAM penetrates below a top surface of the soil;

35 additionally comprising comparing the depth penetration of
36 the PAM below the top surface of the soil of the land area to a set
37 of minimum depth penetration values based upon the general slope
38 of the land area to determine the minimum depth penetration needed

39 for the land area being treated before terminating application of the
40 mixture to the land area; and

41 additionally comprising the step of considering the relative
42 compaction of the soil of the land area, and increasing a number of
43 times of applications of the mixture if the top surface of the soil of
44 the land area has a compacted crust for loosening the compaction of
45 the soil to enhance the penetration of subsequent applications of the
46 mixture into the soil.

1 47. (Previously Presented) The method of claim 46 wherein
2 the establishing step includes mixing PAM and water in a ratio of
3 about 1 part PAM to between about 500 and about 5000 parts water
4 by volume;

5 wherein if the general slope of the land area is between
6 substantially level and a general slope of 4 to 1, inclusive, the
7 sufficient depth penetration is a minimum of about 1.3 inches;

8 wherein if the general slope of the land area is about 3 to 1,
9 the sufficient depth penetration is a minimum of about 1.5 inches;

10 wherein if the general slope of the land area is about 2 to 1,
11 the sufficient depth penetration is a minimum of about 2 inches;

12 wherein if the general slope of the land area is about 1.5 to 1,
13 the sufficient depth penetration is a minimum of about 2.5 inches;

14 and

15 wherein if the general slope of the land area is about 1 to 1 or
16 steeper, the sufficient depth penetration is a minimum of about 3
17 inches.

1 48. (Previously Presented) The method of claim 1
2 additionally comprising determining the degree of stability of the
3 soil of the land area to be treated including testing the vulnerability
4 to erosion of the soil of the land area to be treated.

1 49. (Previously Presented) The method of claim 48 wherein
2 the determining step includes providing at least a first tray,
3 removing a sample of the soil from the land area to be treated,
4 placing at least a portion of the soil sample in the first tray, tilting
5 the first tray to produce a slope in an upper surface of the sample in
6 the first tray.

1 50. (Previously Presented) The method of claim 49
2 additionally comprising pouring a first liquid on the soil sample in
3 the first tray near an uppermost end of the first tray.

1 51. (Previously Presented) The method of claim 50
2 additionally comprising collecting in a first container the portion of
3 the first liquid that drains from a lowermost end of the first tray and
4 any soil particles carried by the portion of the first liquid, and
5 categorizing the appearance of the first liquid and soil particles in
6 the first container based upon a predetermined chart rating the
7 erodability of the soil,
8 wherein when the contents of the first container is clear, the
9 soil is categorized as not erodable,
10 wherein when the contents of the first container is nearly
11 clear, the soil is categorized as slightly erodable,
12 wherein when the contents of the first container is cloudy, the
13 soil is categorized as moderately erodable,
14 wherein when contents of the first container is very silty, the
15 soil is categorized as easily erodable,

16 wherein when contents of the first container is muddy in
17 appearance, the soil is categorized as very erodable, and
18 wherein when contents of the first container is nearly a slurry,
19 the soil is categorized as difficult to control.

1 52. (Previously Presented) The method of claim 49 wherein
2 the slope in the upper surface of the sample in the first tray is
3 approximately 3 to 1.

1 53. (Previously Presented) The method of claim 49 wherein
2 the first liquid comprises water without PAM.

1 54. (Previously Presented) The method of claim 49 wherein
2 the determining step includes:
3 providing a second tray;
4 removing a sample of the soil from the land area to be treated
5 and placing at least a portion of the soil sample in the second tray;
6 tilting the second tray to produce a slope in an upper surface
7 of the sample in the second tray that is substantially equal to the
8 slope of the upper surface of the sample in the first tray;
9 pouring a second liquid on the soil sample in the second tray
10 near an uppermost end of the second tray, the second liquid
11 including water and PAM;
12 collecting in a second container the portion of the second
13 liquid that drains from a lowermost end of the second tray and any
14 soil particles carried by the portion of the second liquid, and
15 comparing movement of soil particles from the second tray
16 into the second container to movement of soil particles from the
17 first tray into the first container.

1 55. (Previously Presented) A method of applying polyacrylamide
2 (PAM) for stabilizing soil particles of a land area from erosive movement
3 about the land area, the method comprising:
4 calculating a total application rate for applying a mixture of PAM and water
5 to be applied to a land area;
6 mixing PAM with water according to a uniform mixture ratio to form a
7 mixture for application to the land area;
8 applying the mixture to a top surface of soil of the land area by misting a
9 first portion of the total application rate of the mixture onto the
10 surface of the land area to produce a tack coat for initially stabilizing
11 topmost soil particles on the top surface of the land area against soil
12 particle movement caused by subsequent mixture applications; and
13 temporarily terminating the application of the mixture to the top surface of
14 the soil after the misting of the first portion of the mixture; and
15 resuming application of the mixture by applying a second portion of the
16 total application rate of the mixture onto the top surface of soil.

1 56. (Previously Presented) The method of claim 55 wherein the step
2 of temporarily terminating the application of the mixture to the top surface
3 of the soil is continued until substantially any accumulations of the mixture
4 on the top surface of the soil have been absorbed into the soil.

1 57. (Previously Presented) The method of claim 56 wherein the step
2 of temporarily terminating the application of the mixture to the top surface
3 of the soil is discontinued before the mixture dries on the top surface of the
4 soil.

1 58. (Previously Presented) The method of claim 55 wherein the step
2 of resuming application of the mixture to the top surface of the soil, after
3 the step of temporarily terminating the application is completed, is
4 performed so that the mixture penetrates the below the top surface to a
5 greater depth than the mixture has penetrated below the top surface during
6 the step of applying the mixture by misting before the step of temporarily
7 terminating the application.

1 59. (Previously Presented) The method of claim 1 further
2 comprising:
3 after an initial application of the PAM and water mixture to the
4 surface of the soil, applying a granular form of PAM to the soil.

1 60. (Previously Presented) A method of applying
2 polyacrylamide (PAM) for stabilizing soil particles of a land area
3 from erosive movement about the land area, the method comprising:
4 establishing a mixture ratio for a mixture of PAM and water to be
5 applied to a land area based upon characteristics of the soil
6 particles of the land area;
7 calculating an application rate for applying the mixture to the soil
8 particles of the land area;
9 mixing PAM with water according to the mixture ratio to form a
10 mixture for application to the land area;
11 applying the mixture to a top surface of soil of the land area; and
12 terminating the application of the mixture when PAM reaches
13 sufficient depth penetration below the top surface of the soil.

1 61. (New) A method of applying polyacrylamide (PAM) for
2 stabilizing soil particles of a land area from erosive movement about
3 the land area, the method comprising:
4 forming a mixture of PAM and water for application to the land area;
5 applying the mixture to a top surface of soil of the land area;
6 terminating the application of the mixture when PAM reaches
7 sufficient depth penetration below the top surface of the soil; and
8 making, after a time period passes after terminating the application, at
9 least one additional application of the mixture to the top surface
10 of the soil.